of the "enter and compete" standard, and then to implement this standard on its own, rather than rely on the state commissions to conduct granular analyses.

7. The *USTA II* Court declared that "in at least one important respect the Commission's definition of impairment is vague almost to the point of being empty." Namely, the Commission did not specify the size or type of CLEC for which entry must be possible, i.e. whether it was "*any* CLEC, no matter how inefficient" or an average or representative CLEC.

8. The Commission can clarify its standard, and respond to the Court, by adopting as a criterion that *impairment exists unless sufficient entry has occurred or is likely to occur to result in workably competitive downstream markets.* Workability is defined as "reasonably satisfactory ... marketplace performance."[4] The focus on *marketplace performance*, which is measured in terms of overall social welfare, rather than the well-being of particular competitors, is fully consistent with the pro-competitive goals of the Act. As Paul Samuelson explained,

> We cannot expect competition to become everywhere "perfectly perfect"... But what we can strive for is what the late J.M. Clark ...called 'workable competition.' By public and private policies we can hope to improve the efficiency with which market prices reflect individual needs, desires, and wants against the background of true costs of goods.[5]

The Telecommunications Act of 1996 established a public policy to "improve the efficiency" of local telecommunications markets by requiring the ILECs to share

[4] Joe S. Bain, *Industrial Organization*, John Wiley & Sons, 1959, at 15.

[5] Paul A. Samuelson, *Economics An Introductory Analysis*, 7th edition, McGraw-Hill, 1967, at 504.

their network. It is entirely reasonable to supplement the impairment standard adopted pursuant to Section 251 with a workable competition standard as a measure of whether unbundled elements are needed by the CLECs.[6]

9. By focusing on the expected level of competition in downstream retail markets for mass-market local service, the Commission can respond to the *USTA II* Court's question about what size or type of CLEC should be used to test impairment. The answer is that entry must be feasible and likely *by enough CLECs to create workably competitive conditions* in downstream markets. This will happen only if a sufficient number of CLECs can achieve a minimum viable scale and overcome other barriers to entry.

10. Stated somewhat differently, workable competition is achieved when entry is profitable for representative CLECs, without atypical advantages or disadvantages. At one extreme, if only an "advantaged" CLEC or two can enter, then the market will become a duopoly or triopoly, which will result in high prices and sub-optimal performance in the downstream markets. At the other extreme, an impairment test should not be based on the barriers to entry faced by an inefficient CLEC, because the downstream market will be competitive without

[6] In the separate declaration addressing the impairment issue for loops and dedicated transport, co-authored by John Mayo, we propose a differently-worded standard: "impairment exists if failure to provide the requested network element poses a barrier or barriers to entry ...where the effect may be to substantially lessen competition or tend to create a monopoly in the provision of the retail services that utilize the requested element." The "lessen competition" standard of the Mayo-Pelcovits Declaration is subsumed within the workably competitive outcome, because if there is workable competition in downstream markets without the availability of a UNE, then the failure to provide the network element does not lessen competition.

the presence of that CLEC. So long as enough CLECs can enter the market successfully and compete on reasonably equal footing, prices will be driven to an efficient level and economic welfare will be optimized.

11. Indeed, it is difficult to conceive how the impairment standard could be fashioned to apply to the atypically inefficient CLEC. In other words, if the Commission were to flesh out an economic model of entry, it would find that *there are no circumstances* under which inefficient CLEC would be able to enter the market successfully. The reason is that once the point is reached where the "typical" CLEC can enter the market successfully, then competition among these CLECs would drive prices down below the cost of an inefficient CLEC. A competitive market can work wonders to root out inefficiency, and there is little reason to fear that the Commission will encourage inefficient entry by being too "generous" to the CLECs.

12. The best evidence of a lack of impairment is actual market entry. If CLECs, confronted with real market conditions, have elected to deploy their own switching facilities to serve a particular market, and have shown that they are viable competitors within that market, then the fact of successful entry demonstrates that impairment does not exist without access to unbundled local switching.

13. In the TRO the Commission decided that impairment did not exist for the switching UNE if three CLECs were providing retail service using their own

switching facilities. The presence of four competitors in a market (the ILEC plus the three CLECs) is a reasonable benchmark for workable competition. It is critical, however, that the CLECs not face significant barriers to expanding output to serve the large customer base now served by the ILEC. Otherwise, the CLECs are merely tokens of competition and cannot create workable competition in the downstream markets. Therefore, the trigger test requires much more than simply counting heads. Rather, it requires that the triggering CLECs are capable of serving the same (or nearly the same) customers as the ILEC without incurring significant cost disadvantages.

14. An impairment standard that assesses performance in the downstream markets also provides a framework for analyzing the significance of intermodal competition. Intermodal competition should "count" towards a finding of no impairment only to the extent that the competitor helps create workable competition in downstream markets. To the extent that consumers consider intermodal competitors as effective substitutes for the wireline-based ILEC or CLEC services, then competition in downstream markets is more likely to be workable.

15. Competition from intermodal service providers, however, does not provide evidence on whether intramodal CLECs can enter the market profitably without certain UNEs, such as switching. Therefore, the presence of an intermodal competitor, such as cable telephony, does not prove whether other CLECs that do not own their own loop facilities can compete without access to the ILEC's

switch. Therefore, the right answer to the question of whether an intermodal competitor counts is: Yes, but in a different way than an intramodal competitor. The presence of a cable telephony competitor to the ILEC does not by itself make the market competitive. At best, the cable competitor will form a duopoly along with the ILEC and contribute nothing towards easing entry barriers faced by CLECs that do not own their own loops.

16. Under the terms of court decisions in the appeals of the Commission's Local Competition and Triennial Review Orders,[7] the Commission is challenged to identify barriers to entry that specifically derive from characteristics particular to the telecommunications market. In many respects a response to this challenge requires the same information and analysis needed to apply the triggers intelligently. Namely, the key issue is whether actual competitors in some market niche, or potential competitors, can expand or enter on a size and scope necessary to create workably competitive conditions in downstream markets. Barriers to entry and barriers to expansion may be one and the same, and the only way to respond to the Court's mandate is to analyze these barriers systematically.

17. Barriers to entry may take many forms. Some may be operational in nature. The ability of ILECs and CLECs to manage large-volume "hot cut" transitions is one example. If the volume of transitions that can be anticipated in serving the local exchange mass market cannot be managed effectively, and if CLECs therefore

[7] *United States Telecom Ass'n v. FCC*, 290 F.3d 415, 427 (D.C. Cir. 2002) (*"USTA I"*); *United States Telecom Ass'n v. FCC*, 359 F. 3d 554, 571-72 (D.C. Cir 2004) (*"USTA II"*).

lack certainty in how quickly customers can be converted from the ILEC's service to the CLECs' service or in the cost that will be incurred to perform each transition, the CLECs will suffer a severe competitive disadvantage, and may not be able to create workably competitive conditions in the marketplace. CLECs also may face operational difficulties due to the nature of facilities that are available under current unbundling rules. CLECs, for example, may not offer digital subscriber line ("DSL") service over loops that are provisioned using digital loop carrier ("DLC") technology. This limitation will affect the ability of the CLECs to serve mass-market customers that demand a bundle of voice service and broadband service.

18. Other barriers to entry are economic in nature. The Commission previously has recognized several forms of economic entry barriers, including scale economies, the presence of large sunk costs, first-mover advantages, and absolute cost advantages.[8] As I will show later in this declaration, each of these economic barriers to entry is present in the provision of local exchange services, and arises from the specific economic characteristics of the provision of those services. The role of economic analysis in assessing CLEC impairment without access to specific ILEC unbundled network elements is to determine whether the confluence of these factors is such that competition will not be effective in downstream markets.

[8] Triennial Review Order (*TRO*), ¶¶87-91.

III. HOW THE COMMISSION SHOULD CONDUCT A PROPER IMPAIRMENT ANALYSIS

19. I will describe a four-step process of conducting an impairment analysis, which closely follows the instructions given to the states in the TRO. Because the Commission will implement this process on its own, however, it can and should take into consideration all of the information now available about entry barriers before making any decision on this matter. A stepwise process is useful to describe how the analysis can be done, but should not be interpreted in a way that puts the Commission in a straitjacket preventing it from looking at all factors that will affect marketplace performance. Indeed, there is no reason that the impairment analysis needs to be conducted in order of the process described here, with the exception that market definition comes before other steps, although even market definition may be informed by data collected at other steps of the process. The Commission can even pursue several parts of the analysis on parallel tracks.

20. Step one in the analysis of CLEC impairment is to define the relevant market properly. This requires a definition both of the relevant product market and a definition of the relevant geographic market.

21. Step two in the process is to examine the market for evidence of actual entry. As I stated earlier in this declaration, the best evidence of a lack of impairment is the actual entry of competitors into a particular local exchange market. If meaningful competitive entry actually has occurred in the relevant product and geographic markets, and the entrants are capable of expanding to serve the ILECs' customers,

then one can unambiguously conclude that entry is, in fact, feasible and that no impairment exists.

22. Step three in the process is to conduct an analysis of the operational barriers facing potential entry or expansion by CLECs using their own switches. The presence of large operational barriers will preclude workable competition in downstream markets.

23. Step four is to conduct an analysis of the economic feasibility of potential CLEC market entry using self-supplied local switching in combination with UNE loops and transport. This analysis together with the evidence of operational barriers will help determine what is now preventing the CLECs from entering and competing in this market. Much of the information gathered in steps three and four will also be useful in trying to assess whether actual entrants should "count" towards meeting the trigger test. The rationale here is that existing competitors are impaired from creating a workably competitive market if they cannot expand to serve the ILEC's large base of customers. This can be seen as either a barrier to entry issue or a market definition issue. Either way, the result of the analysis will be the same.

24. In this declaration, I will discuss the first and fourth steps in the impairment analysis – that is, the proper product and geographic market definition for purposes of assessing actual and potential competitive entry, and the analysis of economic barriers to potential CLEC entry. A separate declaration by Ms. Terry

Murray will discuss evidence on the second step – the analysis of actual competitive entry. A separate declaration by Mr. Michael Starkey will discuss the third step – the analysis of operational barriers to entry and expansion.

25. Before I elaborate on these two steps, however, I would like to emphasize the importance of conducting an impairment analysis that is true to the overriding goal of the Act and the meaning of the impairment statute. Over time, this will require a less formulaic approach than the trigger test adopted in the TRO. The trigger test forces an "all or nothing" approach to the analysis of actual competition, and also is very sensitive to precise borders used for the market definition. This can lead to decisions that are nonsensical from the standpoint of actual consumer welfare.

26. My concern with the TRO's trigger analysis for unbundled switching is that it generates an unnecessary and counterproductive attention to definitional issues, rather than to an understanding of the economics of the marketplace. For example, it is very difficult to define exactly where the mass market ends and the enterprise market begins. Is it one line? Four lines? Does it depend on lines at a single location, or all of a customer's locations? The precise answer to this question may be critical to the count of carriers under the triggers and lead to an arbitrary decision on impairment. By contrast, a more comprehensive analysis of competitive conditions in this market could provide a much clearer picture of whether impairment exists. Another example is whether to count a cable TV telephone service as a triggering company. As I mentioned earlier, cable TV

telephone service does compete against the traditional ILEC service, but may not be viewed as a perfect substitute by all customers. Also, cable telephony does not provide any evidence of the barriers to entry facing other CLECs that do not own their own loops. One way to handle this situation is to "count" cable as a partial competitor of the ILEC. Under the TRO rules this is not possible. Even if, at present, the trigger test is satisfied only in a small number of wire centers, and this remains the case when the cable companies are counted towards the trigger, this does not mean that the role of cable companies will not have to be reexamined if and when the marketplace evolves toward a workably competitive outcome.

A. Market Definition

27. A proper definition of the relevant market is an important first step in performing an impairment analysis. Failure to define the product and geographic markets so as to capture all significant factors that determine the ability of CLECs to provide local switching functions on a competitive basis runs the risk of drawing erroneous conclusions regarding impairment – if the markets are defined too narrowly, impairment may be found where none exists in fact, and if the market is defined too broadly, no impairment may be found where in fact there are products that cannot be competitively supplied in some geographic regions.

28. As I mentioned above, however, the impairment decision should not rest on a razor's edge, and to the extent that the very small changes in the market definition yield very different impairment decisions, there is likely to be a flaw in the underlying decision-making process used by the Commission. Market definition

is a tool used for analyzing market power and competition issues, and the actual definition used in a particular case should be judged based on whether it gives reasonable results in terms of social welfare.

29. The Commission provided guidelines on market definition to the states in the *Triennial Review Order,* which are a good starting point for implementing the impairment decision on its own:

> A state commission shall define the markets in which it will evaluate impairment by determining the relevant geographic area to include in each market. In defining markets, a state commission shall take into consideration the locations of mass market customers actually being served (if any) by competitors, the variation in factors affecting competitors' ability to serve each group of customers, and competitors' ability to target and serve specific markets profitably and efficiently using currently available technologies. A state commission shall not define the relevant geographic area as the entire state.[9]

The *Order* also presents examples of the factors that may vary geographically, such as "how the cost of serving customers varies according to the size of the wire center and the location of the wire center, and the variations in the capabilities of wire centers to provide adequate collocation space and handle large numbers of hot cuts."[10]

30. There is a body of economic analysis that applies to the question of defining markets. Much of the economic literature on market definition has focused on facilitating the assessment of market power in merger and antitrust proceedings. The Commission noted in its *Triennial Review Order* that the market power

[9] 47 C.F.R. § 51.319(d)(2)(i).

[10] *TRO* ¶ 496.

question is somewhat different from the impairment question.[11] Nonetheless, the Commission also acknowledged that the market definition literature developed in the context of merger and antitrust analyses provides helpful guidance for market definition in the impairment context.[12] I have taken this economic literature into account in developing my recommended market definition.

31. The essential economic criterion for whether a product belongs in a relevant market is whether the product can serve as an alternative to consumers in that market. Thus, for example, a Holiday Inn in Gaithersburg, Maryland is not in the same geographic or product market as the Mandarin Oriental Hotel in Southwest Washington DC, even though they are both hotels and are both in the same Metropolitan Statistical Area ("MSA"). The reason is that a large number of the guests at the Mandarin would not be willing to switch to the Holiday Inn.

32. The process of defining a market invariably requires answering questions as to whether a particular product or location belongs in the market, or falls outside its boundaries. These questions are properly answered by considering the extent to which customers regard the various products and locations as substitutes or alternatives.

33. The normal way to begin the analysis is with a single firm's product, offered at a specified location, and then to expand beyond this point to see if products from the expanded product set or geographic area serve as alternatives. Normally, the

[11] *Id.* ¶¶ 74, 109.

[12] *Id.* n. 439.

initial market definition of a specific location and product will turn out to be too small because buyers have acceptable alternatives, or substitutes, outside of the product and location. If buyers regard another firm's product, possibly offered at a different location, as an acceptable substitute, then the market definition should be expanded to include the other firm's product and the other location.

34. The market definition approach I have presented is the same as the one used in the Horizontal Merger Guidelines ("HMG") of the U.S. Department of Justice and the Federal Trade Commission. The HMG states that "a market is defined as a product or group of products and a geographic area in which it is produced or sold such that a hypothetical profit-maximizing firm, not subject to price regulation, that was the only present and future producer or seller of those products in that area likely would impose at least a 'small but significant and not transitory' increase in price, assuming the terms of sale of all other products are held constant." Although the Commission rejected certain applications of the HMG for purposes of an impairment analysis, the *Triennial Review Order* explicitly endorses the relevance of the HMG to the market definition that must underlie any impairment analysis: "We take this lesson of geographic granularity from the HMG without adopting the HMG wholesale."[13] This makes sense because the HMG have authoritative status in industrial organization economics.

35. The HMG describe an approach similar to the one I just described where they "begin with each product (narrowly defined) produced or sold by each merging

[13] *Id.* n. 439.

firm" for the product dimension and "the location of each merging firm (or each plant of a multiplant firm)" for the geographic dimension.[14] This initial tentative market definition is expanded by asking whether consumers regard other products or locations as close enough substitutes that a price increase in the narrowly and tentatively defined market would be met by consumers switching to other products or locations. The notion of "close enough" substitutes is given precision by asking whether a "small but significant and nontransitory" price increase in the narrowly and tentatively defined market would be met by a strong enough substitution response by consumers to make the price increase unprofitable, if it were implemented by a hypothetical monopoly provider controlling all of the products and locations in the tentatively defined market. The tentative market definition is too narrow if it fails to incorporate substitutes that consumers regard as "close enough," as measured by consumers switching in response to a price increase. If a tentative market definition is found to be too narrow, the definition is expanded to incorporate the next best products or locations that consumers regard as "close enough" substitutes.

36. Applying the conventional market definition procedure described above to local telecommunications services begins with identifying the product and geographic starting point for a tentative market definition. In the present case, the starting point is the product and customer location that a requesting CLEC now serves with unbundled access to the incumbent's local switching network element, and

[14] HMG 1.11 Product Market Definition General Standards and 1.21 Geographic Market Definition General Standards.

for which we will seek evidence of no impairment in the form of actual or potential deployment of competitive switching capacity in the same market. "In the same market" means that consumers must find the identified competitive offering to be an acceptable substitute for the offering possible with access to the local switching UNE. The analysis then proceeds to expand these tentative product and geographic markets to include other products or locations that consumers will regard as "close enough" substitutes.

37. In the product market dimension, the Commission should include any alternative to the ILEC's local switching UNE that affords access to the incumbent's loops to provide local voice service, including vertical features and access service. If the Commission retains the simple trigger approach to determine impairment, then it must exclude substitutes to their local services that are not comparable in cost, quality and maturity, such as CMRS, fixed wireless, and Voice Over IP ("VOIP"). The reason is that the triggers count alternatives to ILEC as "all or nothing," and unless the CLEC is very close to being "all," its inclusion would overstate its competitive impact and probability of workable competition. The role of these possible substitutes would be different in a more sophisticated analysis of all forms of actual and potential competition.

38. In the geographic dimension, it takes only a moment's reflection to recognize that consumers of qualifying telecommunications services will not accept any substitutes that do not deliver service to the customer's premises. Because qualifying services provided to a location other than to a customer's own premises

will not generally be a satisfactory substitute, expansion of the tentative market definition to include other locations is not appropriate; the "most accurate" level of granularity must address switching capability for particular customer premises. The relevant point at which qualifying services are provided, analogous to the HMG's "location of each plant" (HMG 1.21), are the Network Interface Devices ("NIDs") that comprise the physical point of interconnection between the incumbent and a customer. Thus, each NID or customer premises is a "location," or "plant," for purposes of defining initial tentative markets. Fortunately, certain aggregations of consumers can be accomplished to achieve "administrative practicability," as I discuss below.

39. The location-specificity of the delivery of services is one of the unique characteristics of markets for telecommunications services, and it is crucial to the task of defining markets in which the prescribed trigger analysis reflects evidence of actual economic entry into relevant markets without access to the incumbent's local switching UNE. The *Triennial Review Order* recognizes this location-specificity in several ways. For example, in defining the geographic markets for application of trigger analysis to enterprise loops, the *Order* requires a customer-by-customer location analysis.[15] Although mass market customers are tied to their locations just as tightly as enterprise customers, the Commission has observed that considerations of practicality will not permit a customer-by-

[15] *Id.* ¶ 328.

customer analysis, for at least some mass market investigations.[16] I demonstrate below that it is possible to aggregate mass market customer locations in such a way (by wire center) as to preserve much of the accuracy of customer-by-customer analysis, while achieving a high degree of practicality. Identifying large groups of customers that are capable of being served using uniform technologies and techniques, but recognizing that those techniques must be applied to deliver service at the customer location, results in market definitions that remain "accurate" but achieve "administrative practicality."

40. Recognizing that each customer comprises a unique geographic market would lead to a "market-by-market" analysis that recognizes that "an important function of the local circuit switch is as a means of accessing the local loop."[17] Or, "a crucial function of the incumbent's local circuit switch is to provide a means of accessing the local loop."[18] The crucial characteristic of loops is that they terminate in the customer's premises, which is the geographic location at which qualifying services are provided and the only geographic point at which customers will accept delivery of services. A market definition that ignored location specificity would fly in the face of the entire foundation of antitrust and regulatory economics. It is nonsensical to ignore the costs and entry barriers faced by CLEC wishing to expand service to unique locations and define away these important cost differences by simply declaring a large group of customers to

[16] *Id.* ¶ 309.
[17] *Id.* ¶ 429.
[18] *Id.* ¶ 439.

be in the same geographic market. The location is the market, and multiple locations cannot be aggregated without an analysis of the specific facts that govern supply conditions in the market.

41. Market definition at the most accurate level of granularity, whether for application of the prescribed triggers or for analysis of potential deployment, would be conducted on a customer-by-customer basis, recognizing that customers will not generally accept a substitute for the incumbent's wireline service if that service is not delivered to the customer's premises. That is, the relevant geographic market for local telecommunications services is customer-location specific. Nevertheless, subject to certain important limitations discussed below, it is possible to analyze customer-specific locations in large numbers, achieving practicality with little or no loss of accuracy.

42. Impairment analysis for mass market switching must identify substitutes to the incumbent's local circuit switch "as a means of accessing the local loop."[19] Wire centers are the centers of outward-radiating ILEC loop facilities, and determine the point at which access to the incumbent's loops must occur. Because impairment regarding the local switching UNE is so closely related to access to the incumbent's loops, the wire center provides a natural unit of analysis. Insofar as an entrant in a particular wire center is not impaired in its ability to expand service to all customers served by loops in that wire center, it is reasonable to aggregate customers and consider impairment issues at the wire center level.

[19] *Id.* ¶ 429.

43. In most cases, CLEC self-provisioning of local switching will require collocation at each wire center the CLEC intends to serve. In those cases in which all competitive facilities deployed are available to serve any loop in the wire centers in which they offer service, trigger analysis can proceed with the wire center as the geographic market definition. In such cases, analysis of the prescribed triggers can proceed at the wire-center level with little or no loss of accuracy.

44. For several reasons, the wire center also provides a natural unit of analysis for the investigation of potential deployment. First, because a portion of the costs of establishing service in a previously unserved wire center will be sunk costs, CLEC entry decisions will have to be justified at the wire center level. This justification will require the CLEC to compare the stream of net operating income projected for a wire center to the sunk cost that must be incurred to establish the collocation or other arrangements needed to offer service in the wire center. Further, various costs and revenues that must be considered in analysis of potential net operating revenue vary, sometimes dramatically, between wire centers. To mention only two: 1) potential revenue from serving a wire center will vary with the number of lines in the wire center and the profile of the typical customer at the wire center, and, 2) the cost of backhauling traffic from the wire center will vary with the wire center's proximity to other elements of the CLEC's network.

45. For the analysis of triggers, the logical data on which to rely initially – facilities in place in the incumbent's wire centers, capabilities of competitors' facilities,

capacity available for expansion – are data that are available and most accurately interpreted at the wire center level. ILEC tariff data needed for the impairment analysis – UNE loop zones and retail rates – is also readily available on a wire center basis. Also, information on customer demographics can be obtained on a wire center basis, either from the data collected for universal service models or from other public sources.

46. Because the CLEC's entry decision will be made at the wire-center level, examination of pertinent data at a higher level of aggregation will be less helpful at best, and very possibly misleading. For example, it would be an error to conclude that entry is feasible in two wire centers because the present value of potential revenues net of operating costs in the two wire centers exceeds the sunk costs of entering the two wire centers. The two wire centers may be like a bucket of ice water and a bucket of boiling water, which, on average, are a comfortable temperature. The fact that entry is feasible in one wire center but not the other will not be revealed from examination of average or total costs for the two wire centers. If the Commission were to find no impairment in both wire centers, the result will be that end users in one of the wire centers will lose the competitive alternatives that would be available to them if CLECs were to retain unbundled access to the incumbent's local circuit switch.

47. Some would argue that many of the CLEC's costs, such as operations support systems, switches, and some marketing costs, are incurred and are useful over relatively large market areas. While there is no question that it is in the interest of

the CLEC to spread the cost of large fixed investments over as broad a customer base as possible, the decision to deploy facilities to provide connectivity to the CLEC's network still is conducted on a very granular basis. As the manager of a CLEC, I may want to add as many customers as possible to lower the cost of my fixed investments, but I gain nothing, and lose much, if the customers in a particular wire center produce negative net revenue. In deciding whether to obtain or construct collocation facilities in an individual wire center, the CLEC manager must consider the number of customers that reasonably can be expected to subscribe to the CLEC's services, the amount of revenue that will be produced by those customer, and must compare the anticipated revenue to the investments and operating expenses associated with adding those collocation facilities to the CLEC's network. If the wire center cannot contribute to the bottom line, it simply will not make sense for the CLEC to offer services to customers in the wire center.

48. The presence of a switch-based CLEC in a wire center does not prove that that CLEC would serve all types of customers out of that wire center. It is important to recognize that there are different classes of customers and that the barriers to entry and expansion are different with respect to these customer classes. One category of customers is residential customers, who are the vast majority of mass market customers, and for whom the customer-specific transactions costs (e.g. ordering, provisioning and servicing) must be very low in order for the service to be profitable. The relatively moderate amounts spent by these customers on

traditional wireline services (approximately $40 per month) means that profit margins will be very low and the per-customer acquisition and service costs correspondingly must be very low. At present, residential customers are served by CLECs using UNE-P. In order to serve these customers with self-provided switching, the CLECs must be able to provide the same quality of service at comparable costs, including the transactions cost of ordering and provisioning the service.

49. Evidence that a CLEC is providing switch-based services to a few business customers using unbundled loops should not be taken as proof that entry barriers have been surmounted in the mass market. Many CLECs provide switch-based services in special circumstances that would not apply across the mass market, even if there is a superficial resemblance between these cases and the mass market. For example, CLECs will provide single-line switch-based service to provision a fax line for a large business customer, or to extend customized services to the residence of a business executive. Also, a CLEC may supplement DS1 based service with a few voice grade loops, if it is cheaper than adding a full DS1 of capacity. These conditions are very different than those faced for serving residential customers, and it would be a mistake to infer something about the mass market from a simple count of CLECs offering service out a particular wire center.

50. The Commission must take account of these differences in the switched-services market if it undertakes a trigger analysis. A CLEC should "count" as an active

competitor in the mass market only if it now serves mass market customers using its own switch. Whether this should be considered a matter of market definition (i.e. residential customers and fax lines are not in the same market), or is used to screen out CLECs that do not provide residential service, is irrelevant. The important point is that conclusions about competition for one type of service should not be drawn from evidence of competition for a very different type of service.

51. I conclude that the appropriate product market definition both for purposes of the assessment of actual competitive entry and for purposes of analyzing potential deployment is the bundle of telecommunications services provided over a local wireline facility to mass-market customers. In performing this assessment, the Commission should keep in mind that the ability of CLECs to serve small pockets of business customers does not prove that they are not impaired with respect to the broader mass market. The geographic market over which both actual and potential deployment should be assessed is the individual wire center.

IV. POTENTIAL MARKET ENTRY

52. Having properly defined the product and geographic markets relevant to the analysis of impairment, and having determined that, in some markets, actual entry by CLECs using self-provisioned local switching has not occurred, or has occurred to a very limited extent, it remains to determine the reasons behind the CLECs failure to enter the mass market for local exchange service. We must distinguish between circumstances where barriers to entry are responsible for

imperfect competition in downstream markets and other possible explanations for this outcome.

53. In the TRO, this analysis was referred to as a "potential competition analysis," and was only to be undertaken if the trigger test was not met.[20] I recommend that the Commission examine the evidence on barriers to entry, separate and apart from the trigger test, because it will shed light on a number of the policy issues raised by the *USTA II* Court. For example, my analysis will show that CLEC entry is not deterred or foreclosed by universal service subsidies. Retail competition between ILECs and CLECs (using UNEP) consists of competing offers of large bundles of telecommunications services, and there is absolutely no evidence that the price of the bundles is being subsidized by any other service, *e.g.*, business services. Sunk cost barriers to entry, coupled with economies of scale and first-mover advantages of the ILECs, discourage the CLECs from entering the market using their own switches. Moreover, the economic barriers to entry do not even come into consideration unless operational barriers to entry, which are described in the Declaration of Michael Starkey, are overcome.

54. In the analysis that follows, I assume that these operational barriers all are overcome. My understanding, however, is that many of these barriers have not been overcome, and that this assumption is counter-factual. I stress, therefore, that unless and until these operational issues have been addressed both as a technical matter and as a cost matter (that is, that the costs of addressing these

[20] TRO, ¶506.

operational barriers is accounted for in some competitively neutral manner), no further analysis is necessary – if UNE-L service cannot be provided in a way that meets the consumers' legitimate demands for high-quality service, any rational carrier would be extremely unlikely to make the investment necessary to provide that service. Only once these operational issues have been addressed, is it possible to look at the question of whether entry is feasible on economic grounds.

A. Analysis of the Entry Decision

55. In order to come to a decision to enter a particular market, the CLEC must conclude that it has a reasonable prospect of obtaining sufficient revenue from its customers both to defray its operating expenses and to recover any investments that it must make to enter the market. In other words, the CLEC must determine that it will make a profit taking into account likely revenues and costs. The CLEC must also take account of the risks that it will not make a profit despite its best estimate that it will. The greater the uncertainty of entry, the less likely the CLEC is to enter.

56. Any attempt to assess the potential for CLEC switch deployment to serve the mass market must take account of variations in cost among the various regions of the country, within the various states, and among the various rate zones, exchanges, and wire centers within each state. Accordingly, the analysis must be conducted at a very granular level.